

The following table shows the highest and lowest temperatures of water observed at the several stations; the monthly ranges of water temperature; the average depth at which the observations were made; and the mean temperature of the air:

Temperature of water for February, 1886.

| Station. | Temperature at bottom. | | Range. | Average depth, feet and tenths. | Mean temperature of the air at station. |
|-----------------------------|------------------------|------|--------|---------------------------------|---|
| | Max. | Min. | | | |
| Atlantic City, New Jersey | 36.3 | 27.9 | 8.4 | 6.9 | 29.9 |
| Alpena, Michigan* | 36.3 | 27.9 | 8.4 | 6.9 | 29.9 |
| Augusta, Georgia | 59.7 | 40.2 | 10.5 | 9.4 | 44.7 |
| Baltimore, Maryland | 36.9 | 31.6 | 5.3 | 9.8 | 31.3 |
| Block Island, Rhode Island | 37.0 | 28.3 | 8.7 | 8.1 | 28.4 |
| Boston, Massachusetts | 35.0 | 29.2 | 5.8 | 20.8 | 26.6 |
| Buffalo, New York* | 61.5 | 45.9 | 15.6 | 7.6 | 54.0 |
| Cedar Keys, Florida | 50.8 | 44.5 | 6.3 | 38.3 | 47.6 |
| Charleston, South Carolina | 33.6 | 32.5 | 1.1 | 8.0 | 28.1 |
| Chicago, Illinois* | 43.2 | 29.8 | 13.4 | 2.3 | 33.6 |
| Chincoteague, Virginia* | 34.9 | 32.3 | 2.6 | 14.0 | 25.4 |
| Cleveland, Ohio* | 37.1 | 31.5 | 5.6 | 17.1 | 20.9 |
| Detroit, Michigan* | 37.1 | 31.5 | 5.6 | 17.1 | 20.9 |
| Duluth, Minnesota* | 37.1 | 31.5 | 5.6 | 17.1 | 20.9 |
| Eastport, Maine | 37.1 | 31.5 | 5.6 | 17.1 | 20.9 |
| Escanaba, Michigan* | 37.1 | 31.5 | 5.6 | 17.1 | 20.9 |
| Galveston, Texas | 57.3 | 46.0 | 11.3 | 12.2 | 53.5 |
| Grand Haven, Michigan* | 32.6 | 32.1 | 0.5 | 19.0 | 23.1 |
| Indianola, Texas | 62.5 | 42.6 | 19.9 | 7.8 | 55.9 |
| Jacksonville, Florida | 58.6 | 50.0 | 8.6 | 18.0 | 53.5 |
| Key West, Florida | 76.7 | 62.2 | 4.5 | 17.7 | 66.0 |
| Mackinaw City, Michigan* | 53.8 | 37.0 | 16.8 | 10.6 | 42.9 |
| Macon, Fort, North Carolina | 53.8 | 37.0 | 16.8 | 10.6 | 42.9 |
| Marquette, Michigan* | 53.8 | 37.0 | 16.8 | 10.6 | 42.9 |
| Milwaukee, Wisconsin* | 53.8 | 37.0 | 16.8 | 10.6 | 42.9 |
| Mobile, Alabama | 50.9 | 44.0 | 6.7 | 16.2 | 49.7 |
| New Haven, Connecticut | 35.0 | 30.3 | 4.7 | 16.1 | 26.1 |
| New London, Connecticut | 35.5 | 31.2 | 4.3 | 12.1 | 27.8 |
| New York City | 33.9 | 30.5 | 3.4 | 17.4 | 28.5 |
| Norfolk, Virginia | 43.3 | 32.6 | 10.7 | 16.2 | 37.7 |
| Pensacola, Florida | 57.8 | 50.2 | 7.6 | 16.7 | 51.2 |
| Portland, Maine | 34.6 | 29.5 | 5.1 | 16.8 | 21.5 |
| Portland, Oregon | 46.4 | 43.0 | 3.4 | 56.5 | 44.7 |
| Sandusky, Ohio* | 35.9 | 29.0 | 6.9 | 5.5 | 28.8 |
| Sandy Hook, New Jersey | 35.9 | 29.0 | 6.9 | 5.5 | 28.8 |
| San Francisco, California | 57.6 | 54.7 | 2.9 | 39.1 | 55.8 |
| Savannah, Georgia | 51.1 | 41.0 | 10.1 | 10.1 | 50.6 |
| Smithville, North Carolina | 53.8 | 35.0 | 18.8 | 10.8 | 43.7 |
| Toledo, Ohio* | 53.8 | 35.0 | 18.8 | 10.8 | 43.7 |
| Wilmington, North Carolina | 53.8 | 35.0 | 18.8 | 10.8 | 43.7 |

* Observations interrupted by ice; see text.

WINDS.

The most frequent directions of the wind during February, 1886, are shown on chart ii by the arrows flying with the wind; they are also given in the tables of miscellaneous meteorological data. In the upper Mississippi and Missouri valleys, New England, and the middle Atlantic states, the prevailing winds were mostly from the northwest; in the Lake region and Ohio Valley they were from south to southwest; in Washington Territory they were from south and southwest; in California from northeast to northwest; in other districts they were variable.

HIGH WINDS.

[In miles per hour.]

Mount Washington, New Hampshire: the eight-hour movement of the wind from 3 to 11 p. m. of the 26th was 925 miles, being at the rate of 115.6 miles per hour, and largely in excess of any previous eight-hour movement ever recorded at this station. The total movement of the wind for the twenty-four hours ending 3 p. m. of the 27th was 2,673 miles, being 533 miles in excess of any previous twenty-four hour movement. During the night of the 26-27th the terrific hurricane caused the building to rock and tremble; huge masses of frost-work were dashed against the station building with reports as loud as the discharge of cannon.

Wind-velocities of fifty or more miles per hour were recorded during the month, as follows:

Mount Washington, New Hampshire, 75, ne., 2d; 63, nw., 3d; 85, nw., 5th; 74, nw., 6th; 82, nw., 8th; 78, nw., 9th; 62, se., 11th; 94, s., 12th; 94, sw., 13th; 68, nw., 14th; 66, nw., 18th; 74, nw., 19th; 78, nw., 20th; 96, nw., 21st; 60, nw., 22d; 70, nw., 23d; 84, nw., 24th; 94, se., 25th; 138, nw., 26th; 131, nw., 27th.

Pike's Peak, Colorado, 54, n., 3d; 76, w., 8th; 60, ne., 9th;

72, w. 12th; 62, w., 13th; 51, n., 15th; 53, nw., 17th; 64, nw., 18th; 51, w., 20th.

Cape Mendocino, California, 62, se., 4th; 72, se., 5th; 75, se., 6th; 52, se., 22d.

Sandy Hook, New Jersey, 55, ne., 11th; 56, nw., 20th; 62, nw., 26th; 72, nw., 27th.

Fort Canby, Washington Territory, 64, sw., 6th; 52, sw., 7th; 50, s., 11th.

Fort Maginnis, Montana, 60, w., 11th; 78, nw., 13th.

Valentine, Nebraska, 75, nw., 18th; 52, nw., 24th.

Chincoteague, Virginia, 52, nw., 20th; 61, nw., 26th.

New York City, 64, nw., 26th; 56, nw., 27th.

Block Island, Rhode Island, 54, n., 4th.

Cape Henry, Virginia, 52, n., 4th.

Tatoosh Island, Washington Territory, 56., se., 8th.

Fort Shaw, Montana, 52, sw., 11th.

Fort Assinaboine, Montana, 55 w., 11th.

Fort Benton, Montana, 58, sw., 11th.

Rochester, New York, 54, w., 13th.

Fort Totten, Dakota, 56, nw., 24th.

Buffalo, New York, 57, w., 25th.

Sandusky, Ohio, 51, nw., 26th.

LOCAL STORMS.

Little Rock, Arkansas: a severe thunder-storm, moving from southwest to northeast and accompanied by heavy rain, occurred at 11.10 p. m. of the 9th; the lightning, which was intense, struck a dwelling and damaged it to the amount of \$250.

NAVIGATION.

In the following table are shown the danger-points at the various river stations; the highest and lowest depths for February, 1886, with the dates of occurrence, and the monthly ranges:

Heights of rivers above low-water mark, February, 1886.

[Expressed in feet and tenths.]

| Stations. | Danger-point on gauge. | Highest water. | | Lowest water. | | Monthly range. |
|---------------------------|------------------------|----------------|---------|---------------|---------|----------------|
| | | Date. | Height. | Date. | Height. | |
| <i>Red River:</i> | | | | | | |
| Shreveport, Louisiana | 29.9 | 12 | 16.1 | 25 | 11.4 | 4.7 |
| <i>Arkansas River:</i> | | | | | | |
| Fort Smith, Arkansas | 22.0 | 14 | 14.9 | 1 | 3.2 | 11.7 |
| Little Rock, Arkansas* | 23.0 | 15 | 15.8 | 8 | 4.3 | 11.5 |
| <i>Missouri River:</i> | | | | | | |
| Yankton, Dakota* | 24.0 | | | | | |
| Omaha, Nebraska* | 18.0 | | | | | |
| Leavenworth, Kansas | 20.0 | 28 | 8.4 | 22 | 6.9 | 1.5 |
| <i>Mississippi River:</i> | | | | | | |
| Saint Paul, Minnesota* | 14.5 | | | | | |
| La Crosse, Wisconsin* | 24.0 | | | | | |
| Dubuque, Iowa* | 16.0 | | | | | |
| Davenport, Iowa* | 15.0 | | | | | |
| Keokuk, Iowa* | 14.0 | 24, 25 | 14.7 | 23 | 13.0 | 1.7 |
| Saint Louis, Missouri | 32.0 | 13 | 23.1 | 22 | 13.9 | 9.2 |
| St. Louis, Illinois | 40.0 | 21, 22 | 38.5 | 10 | 20.7 | 17.8 |
| Memphis, Tennessee | 34.0 | 25, 26 | 29.6 | 12 | 14.8 | 14.8 |
| Vicksburg, Mississippi | 41.0 | 28 | 37.7 | 15 | 23.7 | 14.0 |
| New Orleans, Louisiana | 13.0 | 28 | 12.1 | 17, 18 | 8.0 | 4.1 |
| <i>Ohio River:</i> | | | | | | |
| Pittsburg, Pennsylvania | 22.0 | 14 | 19.5 | 7 | 3.0 | 16.5 |
| Cincinnati, Ohio | 50.0 | 17 | 40.1 | 10 | 14.1 | 26.0 |
| Louisville, Kentucky | 25.0 | 19 | 15.4 | 11 | 7.2 | 8.2 |
| <i>Cumberland River:</i> | | | | | | |
| Nashville, Tennessee | 40.0 | 17 | 35.2 | 8, 9 | 8.7 | 26.5 |
| <i>Tennessee River:</i> | | | | | | |
| Knoxville, Tennessee | | 1, 19 | 4.2 | 11 | 1.8 | 2.4 |
| Chattanooga, Tennessee | 33.0 | 14 | 13.1 | 10 | 5.5 | 7.6 |
| <i>Monongahela River:</i> | | | | | | |
| Pittsburg, Pennsylvania | 29.0 | 14 | 19.5 | 7 | 3.0 | 16.5 |
| <i>Savannah River:</i> | | | | | | |
| Augusta, Georgia | 32.0 | 5 | 11.5 | 25 | 8.2 | 3.3 |
| <i>Mobile River:</i> | | | | | | |
| Mobile, Alabama | | 11, 14 | 17.3 | 20 | 15.3 | 2.0 |
| <i>Sacramento River:</i> | | | | | | |
| Rod Bluff, California | | 1 | 9.6 | 26 | 2.7 | 6.9 |
| Sacramento, California | | 1 | 25.0 | 28 | 19.8 | 5.2 |
| <i>Willamette River:</i> | | | | | | |
| Portland, Oregon | | 4 | 17.1 | 28 | 4.3 | 12.8 |
| <i>Colorado River:</i> | | | | | | |
| Yuma, Arizona | | 1 | 16.4 | 23 to 28 | 15.3 | 1.4 |

* Observations interrupted by ice; see text.

STAGE OF WATER IN RIVERS.

The Mississippi River was frozen throughout the month at all stations north of Keokuk, Iowa; at Keokuk an ice dam in the river caused the water to rise 0.7 feet above the danger-line on the 24th and 25th.

The Missouri River at Fort Buford, Dakota, rose and flowed over the ice from the 12th to the 20th, the ice remaining solid throughout the month; the river was also frozen during the month at Yankton, Dakota, and Omaha, Nebraska.

The Ohio River at Pittsburg, Pennsylvania, rose steadily during the 12th and 13th, and reached its maximum height, 19.5 feet, at 11 a. m. of the 14th; the lowest stage recorded during the month was 3.0 feet, on the 7th; navigation was resumed on the 15th.

The Cumberland River at Nashville, Tennessee, rose rapidly on the 11th and reached its highest stage, 35.2 feet, on the 17th.

ICE IN RIVERS AND HARBORS.

Mississippi River.—Keokuk, Iowa: river frozen from 1st to 22d; the ice in the river moved about half a mile on the 22d, and at 2.45 p. m. of the 23d a general movement of the ice began, leaving the river clear in front of this station, but later in the day an ice dam formed half a mile below this city, which continued until the close of the month.

Saint Louis, Missouri: the ice gorge in the river broke on the 10th, but again gorged after moving about one hundred feet, it also broke and gorged on the 13th and finally broke on the 14th and passed out, leaving the harbor clear; navigation was resumed on the 17th; floating ice, 24th, 25th, 26th.

Cairo, Illinois: river frozen, 1st to 11th; ice broke and run out on the 12th; at Belmont, Missouri, twenty-one miles below this city, the Iron Mountain incline was crushed and about one hundred feet was carried away on the 13th; six barges were also carried away; on the 13th the break in the ice extended fifty miles above this city, the ice piling twenty feet high along the bank of the river; at Spie's Mills, above this place, the ice was reported piled sixty feet high; on the 14th the ice broke as far as Saint Louis, but owing to the heavy drifts the river was not navigable; navigation was resumed between this city and Saint Louis on the 17th; floating ice was observed in the river from the 15th to 24th.

Memphis, Tennessee: floating ice in the river, 4th to 8th, 15th.

Missouri River.—Fort Benton, Montana: ice in the river broke and moved out on the 11th.

Vermillion, Clay county, Dakota: the ice in the river broke on the 22d.

Leavenworth, Kansas: ice in the river broke on the 20th and moved out, causing but little damage; floating ice was observed from the 21st to 28th.

Platte River.—Yutan, Saunders county, Nebraska: ice in river broke on 24th.

Walnut Creek.—El Dorado, Butler county, Kansas: ice broke on the 14th.

Big Blue River.—Manhattan, Riley county, Kansas: river opened on the 18th.

Arkansas River.—Fort Smith, Arkansas: ice in the river broke and navigation resumed on the 1st.

Little Rock, Arkansas: river froze, 3d to 7th; navigation resumed on the 8th.

Illinois River.—Pekin, Tazewell county, Illinois: ice broke in the river and began to move out on the 14th.

Ohio River.—Pittsburg, Pennsylvania: ice was observed in the river every day during the month.

Parkersburg, Wood county, West Virginia: navigation was resumed on the 17th; floating ice, 22d, 28th.

Cincinnati, Ohio: floating ice in the river, 3d, 4th, 5th, 7th to 10th.

Vevay, Switzerland county, Indiana: the first steamer since the suspension of navigation arrived on the 10th; floating ice in the river, 10th, 11th, 18th.

Louisville, Kentucky: floating ice in the river from 3d to 12th.

Cairo, Illinois: floating ice in the river, 1st to 12th.

Grand River.—Grand Haven, Michigan: river frozen, 1st to 12th, 16th to 22d, 26th.

Saint Clair River.—Port Huron, Michigan: the river was open from Lake Huron to Marysville, Michigan, on the 11th; floating ice in river, 24th to 26th.

Sandusky River.—Tiffin, Seneca county, Ohio: ice in the river broke on the 11th.

Lake Erie.—Buffalo, New York: ice in the lake was very much broken on the 13th, and moved in large fields down the Niagara River.

Hudson River.—Menand Station (near Albany), New York: the ice broke in the upper Hudson on the 14th and gorged at a point opposite this station.

Albany, New York: an ice dam formed on the 13th, which remained unbroken up to the close of the month.

New York City: floating ice in the river interfered with navigation on the 3d, 5th, 8th.

Casco Bay.—Portland, Maine: ice formed in the harbor on the 5th and 6th.

Mount Hope Bay and Taunton River.—Fall River, Massachusetts: navigation for sailing vessels on the bay and river was suspended from the 5th to 9th.

Connecticut River.—Hartford, Connecticut: the ice in the river broke at noon of the 15th, destroying Chapin's dock in its passage.

New Haven Bay.—New Haven, Connecticut: harbor frozen on the 5th; steamers experienced great difficulty in breaking their way to the docks.

Long Island Sound.—Setauket, Suffolk county, New York: harbor clear of ice on the 13th, but froze again on the 28th.

Sandy Hook Bay.—Sandy Hook, New Jersey: ice in the bay interfered with navigation on the 5th and 28th.

Susquehanna River.—Catawissa, Columbia county, Pennsylvania: the ice which gorged in the north branch of the river on January 31st broke up and passed out without doing damage on the 13th.

Delaware River.—Beverly, Burlington county, New Jersey: the river channel was clear of ice on the 13th; the Philadelphia ice-boat went up the river as far as Burlington, New Jersey, and returned during the morning of the 14th; large quantities of ice and debris floated down all day.

Philadelphia, Pennsylvania: ice in river broke and passed off without doing much damage on the 14th.

Delaware Bay.—Cape Henlopen: large quantities of ice in the bay impeded navigation on the 8th, 9th, 14th.

Patapsco River and Chesapeake Bay.—Baltimore, Maryland: ice in the river and bay seriously interfered with navigation from the 6th to 16th.

Potomac River.—Washington City: a very rapid rise in the river occurred on the 13th; the ice broke and ran out in large quantities.

Chincoteague Bay.—Chincoteague, Virginia: bay frozen, 4th to 12th, causing the suspension of navigation.

Kitty Hawk Bay.—Kitty Hawk, North Carolina: bay frozen, 5th to 11th.

Pamlico Sound.—Hatteras, North Carolina: sound frozen from the 6th to 10th.

Cape Fear River.—Smithville, North Carolina: considerable floating ice in the river on the 6th.

Currituck Sound.—Wash Woods, North Carolina: sound frozen from the 3d to 9th.

FLOODS.

Maryland.—Port Deposit, Cecil county: about 4.30 p. m. of the 12th the ice in the Susquehanna River broke and the water rapidly rose, overflowed its banks, and swept through the lower portion of the town, flooding the streets to the depth of three or four feet; subsequently the water found vent and receded; at 4 p. m. of the 13th an ice gorge formed and at 8 p. m. the water again rose until it reached a height two feet higher than in the disastrous freshet of 1875; houses, out-buildings, and sheds of all kinds were caught up by the flood and crushed by the heavy running ice, lumber-yards and wharves were inundated, and immense quantities of lumber carried away. The damage is estimated at \$50,000.

Pennsylvania.—Harrisburg, Dauphin county: the ice in the Susquehanna River broke at this place on the morning of the

13th, and gorged at various points, causing a rapid rise in the river; the track of the Pennsylvania Railroad was submerged and much damage done by the heavy floating ice; a portion of the town was four feet under water. At Middletown, this county, the current was so strong after the gorge gave way that a channel fifty feet wide was washed through one of the large islands in the river. The damage is estimated at from \$25,000 to \$30,000.

Williamsport, Lycoming county: at midnight of the 13th the ice in the Susquehanna River broke and the water rose to the height of seventeen feet, doing considerable damage.

Norristown, Montgomery county: an ice gorge formed in the Schuylkill River on the 12th and caused a freshet; the rising water compelled the stoppage of nearly all the mills.

Reading, Berks county: an ice gorge formed about midnight of the 11th at Shomakerville, fifteen miles north of this place; large blocks of ice were piled many feet high and when the water rose the ice was pushed on the adjoining lowlands, sweeping away trees, fences, small out-buildings, and flooding many farm houses; the gorge broke on the morning of the 12th, and great damage was done to property in this vicinity.

Philadelphia: the heavy rain of the 11-12th caused the water in the Schuylkill River to reach a higher point than at any time since 1861; mills were flooded, and considerable damage done to property along the banks of the river.

New Jersey.—Trenton, Mercer county: a heavy freshet occurred in the Delaware River on the 12th; the water rose as high as the second story of dwellings in some places. Between this city and Bordentown several ice-houses were swept away, and huge blocks of ice were heaped along the river banks; the Pennsylvania shore was submerged and railroad trains delayed. The loss was very heavy, falling mostly on the poorer classes. Such a disastrous flood has not been experienced since the freshet of 1857.

New Brunswick, Middlesex county: the heavy rain and previous thaw dislodged the ice in the Raritan River and carried it down the stream where it formed a dam on the 12th, causing the river to overflow, flooding the neighboring streets and buildings along the banks; the cables and telegraph poles at the landings in the lower part of the city were carried away.

Bound Brook, Somerset county: the Raritan River overflowed its banks on the 12th, completely inundating the lower part of the town; the water was eight inches deep on the floor of the post office; mills were submerged and compelled to shut down, and a small bridge on the Lehigh Valley Railroad was carried away.

Newark, Essex county: the river rose two feet above high-water mark on the 12th, and many of the streets and wharves were inundated.

Elizabeth, Union county: Elizabeth River overflowed on the 12th, compelling people living on the banks to move to the upper floors for safety; ten thousand tons of cut ice were carried away.

Rahway, Union county: the Rahway River was greatly swollen on the 12th; many houses were flooded, streets inundated, bridges carried away, and a large quantity of lumber lost.

Jamesburg, Middlesex county: two railroad bridges were washed away by the freshet of the 12th, and considerable damage done.

Long Branch, Monmouth county: the heavy rain of the 11th did considerable damage; several factories and mills were flooded, and Mill street was entirely submerged.

New York.—Schenectady, Schenectady county: the ice in the Mohawk River broke at 4.30 p. m. of the 13th and gorged against the bridges, causing a rapid rise in the water; in half an hour it was one foot above the highest point ever known at this place; streets were flooded to the depth of ten feet, the water flowing over the Scotia Embankment (twenty-one feet high) and flooding the flats for a distance of several miles back. Large blocks of ice floated about the submerged streets, smashing doors and windows; a large number of factories were com-

pelled to suspend work on account of the high water. The damage is difficult to estimate.

Troy, Rensselaer county: the ice in the Hudson River above the state dam broke about 9 p. m. of the 13th and gorged in the narrows below; at 1 a. m. of the 14th the river began to rise rapidly and almost immediately recede, this state of affairs continued until 7 a. m., when a steady rise set in; at noon the water had reached the height of twenty-six feet above low-water mark, or within four inches of the height attained by the memorable flood of February 9, 1857. Many of the streets in the lower part of the city were submerged, and the railroad track between this city and Albany was rendered impassable. The loss in the city will approximate half a million dollars. Reports from Nassau, this county, state that a large covered bridge was carried away, and at Quacken Kill the water and ice carried away three bridges.

Albany: the river rose rapidly during the morning of the 14th, and at noon a freshet of fifteen feet prevailed; considerable damage was done by the flooding of cellars and basements, railroad trains were delayed on account of washouts, and great damage was reported from all points along the banks of the river.

Nyack, Rockland county: the severest rain storm for several years occurred on the 11th, causing freshets in all the streams; the main thoroughfare from this town into the interior of the county was covered with water to the depth of four feet. At Orangeburg the water was so deep over the track of the West Shore Railroad as to interfere with the running of trains.

Connecticut.—New London: the heavy rain of the 11-12th, together with the snow on the ground (amounting to six or seven inches), which melted and added to the immense volume of water that fell, caused freshets everywhere throughout New London county. The ice in the Thames River rose in great floes before the flood and was soon broken up; the streets throughout the city were submerged and cellars flooded; the total damage within the city limits amounts to \$20,000, while the loss in the county will aggregate more than a million dollars. The great dam on the Shetucket River (built three years ago at a cost of \$200,000), which furnished the power that turned the wheels of a dozen mills, was carried away.

Norwich, New London county: the heaviest rain for years occurred on the 11-12th; the water in the Shetucket and Yantic Rivers, which form a junction with the Thames at this point, overflowed, causing the most destructive flood in the history of the state; the entire eastern portion of the city was inundated, deluging farms, breaking reservoirs, and carrying away bridges. At Jewett City, twelve miles north of this city, the Ashland Company's dam, two of the Slater Mill dams, dye house, machine shop, and two iron railway bridges were swept away, causing a loss of \$200,000. The dam at Greenville, two miles above this city, was also washed away, causing a loss of \$100,000. The total loss in this portion of the state will exceed one million dollars.

New Haven: the Quinnipiac River overflowed the lowlands northeast of this city on the 13th; washouts occurred on railroads, and bridges and dams were carried away.

Rhode Island.—Providence: the heavy rainfall produced floods in this city and throughout the state on the 12th almost unprecedented; hundreds of dams and bridges were swept away, mill property seriously damaged, and thousands of operators thrown out of employment. It is estimated that the damage will amount to more than a million dollars.

Woonsocket, Providence county: the freshet of the 12th destroyed the water-works reservoir and caused heavy washouts along the line of the railroads; nearly all the mills were compelled to shut down. The damage will amount to many thousand dollars.

At Newport, mill property was greatly damaged and roads badly washed; at Westerly, Washington county, several houses and bridges were carried away; at Phoenix, Kent county, the Harrisville dam was destroyed, and the ice did great damage to mills; at Saylesville, Providence county, the damage caused by the flood amounts to nearly \$100,000.

Hartford, Hartford county: the heavy rainfall of the 11-13th caused a freshet in the Connecticut River, and in all streams throughout the state; at towns within eight to twelve miles of this place mills were inundated; at Meriden, eighteen miles south, several large factories were compelled to suspend operations. Numerous washouts occurred on the New York and New England Railroad, preventing the running of trains.

Massachusetts.—Boston: the heavy rain of the 12-13th, together with six or seven inches of snow on the ground, caused one of the most destructive floods in the south end of the city that has ever occurred; it is estimated that the damage in Boston alone will amount to half a million dollars.

Fall River, Bristol county: the heavy rain of the 11-13th turned the streets and flats into rivers and ponds, filling cellars and basements of several mills, doing great damage to the stock. Numerous washouts occurred along the line of the railroad. The damage in this city will amount to \$10,000.

Peabody, Essex county: the worst freshet ever known at this place occurred on the 12th; streets were inundated and cellars flooded. The loss is estimated at from \$25,000 to \$30,000.

Brockton, Plymouth county: the flood in the Salisbury River on the 12th inundated several factories, compelling the suspension of work and seriously damaging the stock and machinery; streets were submerged, and the bridge over the main thoroughfare carried away. The damage to property, both public and private, will amount to nearly \$100,000.

Malden, Middlesex county: Barrett's Pond overflowed on the 12th, flooding the lower floors of all buildings on its banks. Goods in Cochran's print and turkey-red works were damaged to the amount of \$20,000; the cotton factory of George K. Goulding was flooded, and \$10,000 worth of cotton ruined. The loss in this city is estimated at \$50,000.

Franklin, Norfolk county: in addition to the large loss resulting from the flood, the Cumberland dam of the Pautucket water-works, built last fall, was swept away on the 12th, causing a loss of \$100,000.

Foxborough, Norfolk county: the flood of the 12th caused damage to mills and factories to the amount of \$37,000.

Gloucester, Essex county: the flood of the 12th was the most destructive ever known; streets were impassable, houses flooded, and great damage done.

New Bedford, Bristol county: the heavy rain of the 11-12th caused considerable damage in the northern part of the city; several washouts occurred on the line of the Old Colony Railroad.

Taunton, Bristol county: the rainfall of the 11-12th was the greatest for the past eighteen years; Mill River overflowed its banks, flooding the streets, filling cellars, and causing washouts on the railroads. Most of the bridges in the city were carried away or badly damaged, and gullies in some cases fifty feet wide were cut in the streets. All the dams in the river were swept away or rendered useless. The damage is estimated at \$200,000.

Somerset, Bristol county: the heavy rains of the 11-12th caused a destructive flood; dams and bridges were washed away, roads deeply gullied and made impassable, fields turned into lakes, and many cellars flooded. Mails were delayed four days owing to the damage done to railroads.

Natick, Middlesex county: a large washout occurred at this place on the Boston and Albany Railroad, the break being fifty feet wide and fifteen feet deep; railroad traffic was suspended from noon of the 13th until the evening of the 15th.

The damage by the flood at Winchester, Middlesex county, is estimated at \$35,000; Newton, Middlesex county, \$25,000; Quincy, Norfolk county, \$25,000; Watertown, Middlesex county, \$20,000; at Wollastou, Norfolk county, the lowlands were flooded to the depth of ten feet, and many families had to be moved in boats; two dams were washed away at Stoughton, Norfolk county, and great damage was done at Attleborough, Bristol county.

Illinois.—Pekin, Tazewell county: the Illinois River rose to

eleven feet above "tidal" mark on the 15th and continued high until the 23d; the lowlands were submerged on the 19th.

HIGH TIDES.

Eastport, Maine, 19th, 20th, 21st, 22d.
Jersey City, New Jersey, 12th.

LOW TIDES.

New York City: the high wind of the 26-27th blew a large portion of the water out of the harbor, causing the lowest tide known for many years; at high tide during the afternoon of the 27th the water was below the ordinary low-water mark.

Philadelphia, Pennsylvania: owing to the unusually low tide on the 27th and 28th vessels were unable to make their way up or down the river.

Low tides were also reported from the following stations:

Sandy Hook, New Jersey, 27th.
Chincoteague, Virginia, 19th to 22d.
Indianola, Texas, 16th, 19th.

VERIFICATIONS.

INDICATIONS.

The detailed comparison of the tri-daily indications for districts east of the Rocky Mountains during February 1886, with the telegraphic reports for the succeeding thirty-two hours, shows the general average percentage of verifications to be 83.90 per cent. The percentages for the four elements are: Weather, 87.32; direction of the wind, 83.73; temperature, 81.19; barometer, 82.69 per cent. By geographical districts, they are: For New England, 81.68; middle Atlantic states, 84.95; south Atlantic states, 87.85; eastern Gulf states, 87.68; western Gulf states, 84.65; lower lake region, 83.28; upper lake region, 81.48; Ohio Valley and Tennessee, 84.34; upper Mississippi valley, 80.29; Missouri Valley, 83.15. There was one omission to predict, out of 2,894, or 0.03 per cent. Of the 2,893 predictions that have been made, ninety, or 3.11 per cent., are considered to have entirely failed; one hundred and two, or 3.52 per cent., were one-fourth verified; three hundred and forty-eight, or 12.03 per cent., were one-half verified; five hundred and one, or 17.32 per cent., were three-fourths verified; 1,852, or 64.02 per cent., were fully verified, so far as can be ascertained from the tri-daily reports.

The percentages of verifications of special predictions for certain localities are, as follows:

Omaha, Nebraska (twenty-four days), 81.25; Arkansas (twenty-four days), 85.42; Baltimore, Maryland (twenty-four days), 87.00; Washington City, 86.16; Portland, Maine, 76.34; Boston, Massachusetts, 83.93; Albany, New York, 75.89; Pittsburgh, Pennsylvania, 75.00; Erie, Pennsylvania, 71.88; Lynchburg, Virginia, 77.23; Cincinnati, Ohio, 77.67; Louisville, Kentucky, 79.46; Columbus, Ohio, 77.22; Cleveland, Ohio, 73.21; Oswego, New York, 75.90; Rochester, New York, 71.88; Buffalo, New York, 70.54; Indianapolis, Indiana, 81.70; Detroit, Michigan, 76.79; Toledo, Ohio, 75.00; Sandusky, Ohio, 76.79; Cairo, Illinois, 83.04; Saint Louis, Missouri, 82.14; Kansas (eighteen days), 87.50; Saint Paul, Minnesota, 75.89; Iowa, 79.91; Milwaukee, Wisconsin, 70.54; Chicago, Illinois, 75.00; Memphis, Tennessee, 85.71; Tennessee, 84.82; Shreveport, Louisiana, 84.38; Georgia, 87.95; northern Florida, 84.82; western Missouri (eleven days), 85.23; New York City, 88.84; Philadelphia, Pennsylvania, 83.48; Colorado, 90.18.

CAUTIONARY SIGNALS.

During February, 1886, one hundred and forty-six cautionary signals were ordered. Of these, one hundred and thirty, or 89.04 per cent., were justified by winds of twenty-five miles or more per hour at or within one hundred miles of the station. Fifty-three cautionary off-shore signals were ordered, of which number, forty-nine, or 92.45 per cent., were fully justified, both as to direction and velocity; fifty-two, or 98.11 per cent., were justified as to direction; and forty-nine, or 92.45 per cent., were justified as to velocity. One hundred and ninety-nine signals of all kinds were ordered, one hundred and seventy-nine, or 89.95 per cent., being fully justified. These do